

Patent claims:

1. Layer arrangement

- with a substrate;
- having a layer which is arranged on the substrate and includes a first subregion comprising decomposable material and a second subregion which is arranged next to the first subregion and has a useful structure comprising a non-decomposable material;
- having a covering layer on the layer comprising decomposable material and the useful structure;
- having an electrically conducted passivation layer at least between the useful structure and the covering layer;
- the layer arrangement being designed in such a manner that the decomposable material can be removed from the layer arrangement by diffusing through the covering layer.

2. Layer arrangement according to Claim 1, having an intermediate layer between the substrate and the layer comprising decomposable material and the useful structure.

3. The layer arrangement as claimed in Claim 1 or 2, in which the substrate includes silicon.

4. The layer arrangement as claimed in Claim 2 or 3, in which the covering layer and/or the intermediate layer is made from dielectric material.

5. The layer arrangement as claimed in one of Claims 2 to 4, in which the covering layer and/or the intermediate layer comprises one or a combination of the materials

- silicon oxide;
- silicon nitride;
- SiLK;
- porous SiLK;
- oxazole;
- porous oxazole;
- Black Diamond;
- Coral;

- Nanoglass;
- JSR LKD;
- polybenzoxazole;
- polybenzimidazole;
- polyimide;
- polyquinoline;
- polyquinoxaline;
- polyarylene; and
- polyarylene ether.

6. The layer arrangement as claimed in one of Claims 1 to 5, in which the covering layer is designed in such a manner that it is permeable to decomposable material which has decomposed.

7. The layer arrangement as claimed in one of Claims 1 to 6, in which the useful structure is made from an electrically conductive material.

8. The layer arrangement as claimed in Claim 7, in which the useful structure includes

- silver;
- a silver alloy;
- tungsten;
- tungsten silicide;
- aluminium;
- an aluminium alloy;
- copper; and/or
- a copper alloy.

9. Layer arrangement according to one of Claims 1 to 6, in which the useful structure is made from a dielectric material.

10. Layer arrangement according to Claim 9, in which the useful structure includes

- silicon dioxide;
- silicon nitride; and/or
- a ceramic material.

11. The layer arrangement as claimed in one of Claims 1 to 10, in which the decomposable material is thermally decomposable.

12. The layer arrangement as claimed in one of Claims 1 to 11, in which the decomposable material includes one or a combination of

- polyester;
- polyether;
- polyethylene glycol;
- polypropylene glycol;
- polyethylene oxide;
- polypropylene oxide;
- polyacrylate;
- polymethacrylate;
- polyacetal;
- polyketal;
- polycarbonate;
- polyurethane;
- polyether ketone;
- cycloaliphatic polymer;
- polynorbornene;
- aliphatic polyamide;
- Novolak;
- polyvinylphenol;
- an epoxy compound;
- copolymer of these compounds; and
- terpolymer of these compounds.

13. Layer arrangement according to one of Claims 1 to 12, in which the decomposable material is photosensitive.

14. Layer arrangement according to one of Claims 1 to 13, in which at least one support structure is formed in the layer arranged between the substrate and the covering layer.

15. Layer arrangement according to one of Claims 1 to 14, having a protective structure, which runs along the lateral

boundary of the substrate, to protect the useful structure from environmental influences.

16. Layer arrangement according to one of Claims 1 to 15, having a passivation layer which at least partially surrounds the useful structure.

17. A process for producing a layer arrangement, in which

- a layer which includes a first subregion comprising decomposable material and a second subregion which is arranged next to the first subregion and has a useful structure comprising a non-decomposable material is formed on a substrate;
- a covering layer is formed on the layer comprising decomposable material and the useful structure;
- an electrically conductive passivation layer is formed at least between the useful structure and the covering layer;
- the layer arrangement being designed in such a manner that the decomposable material can be removed from the layer arrangement by diffusing through the covering layer.

18. Process according to Claim 17, in which the decomposable material is removed from the layer arrangement.

19. Process according to Claim 18, in which the decomposable material is removed from the layer arrangement by means of thermal decomposition.

20. Process according to one of Claims 17 to 19, in which

- the useful structure is formed from copper;
- the useful structure is at least partially sheathed by a passivation layer, which passivation layer
 - is formed from cobalt-tungsten-phosphorus, cobalt-tungsten-boron, cobalt-phosphorus or ruthenium by means of an electroless deposition process; or
 - is formed from tantalum, tantalum nitride, titanium nitride, tungsten, tungsten nitride or tungsten carbide by means of a chemical vapour deposition process.

21. Process according to one of Claims 17 to 20, in which the layer comprising decomposable material and the useful structure is formed by

- decomposable material being deposited and patterned;
- material of the useful structure being deposited;
- the surface of the layer sequence obtained in this way being planarized.

22. Process according to one of Claims 17 to 20, in which the layer comprising decomposable material and the useful structure is formed by

- material of the useful structure being deposited and patterned;
- decomposable material being deposited;
- the surface of the layer sequence obtained in this way being planarized.

23. Process according to one of Claims 17 to 22, in which at least one additional layer stack is formed on the covering layer, the additional layer stack having an additional covering layer on an additional layer comprising decomposable material and a useful structure.

24. Process according to Claim 23, in which useful structures which are separated from one another by a covering layer are coupled to one another by at least one contact hole being introduced into the covering layer and being filled with electrically conductive material.